

ment for the verity of his theory of tumor formation, claiming that thus tumors, which spring from "cell residua," representing early embryonic periods, must grow much more rapidly than those coming from rests developing later. Richness in nuclear matter, small proportion of protoplasm, absence or incompeteness of differentiation have long been regarded as evidence of the youthful type of cells and the converse of mature cells. But the particular adaptation to show that age progresses most rapidly in the earliest, and more slowly in the more advanced periods of life, is new and of interest and significance. It has its more immediate bearing upon the broad biological conception of life and living things, but may well find eventual application, even though at present from the utilitarian standpoint it seems no more than collateral evidence of the reasonableness of efforts to prolong life to a natural death at a later period than is ordinarily seen in human beings. It would be no matter of advantage to intelligent beings that differentiation should be slowed in the period of extreme youth, even could such a result be effected; the senescence of differentiation of structure and function must be accepted for the acquirement of that grade of intelligence and other functions which make life worth the living, even though the price of the acquisition be inevitable death. In the slowing of the post maturation stage rests the real problem, not necessarily involving the entire mass of component cells of the system, but at least those groups essential to bodily persistence and performance of functions essential to the individual. Whatever the answer, it cannot evade death; rejuvenescence of the individual is impossible, it can merely look to the prolongation of the mature period of life; much aging must necessarily have already been experienced, and it can only lie (adventitious causes of disease and death being disregarded) in more perfect maintenance of functional harmony in the body, in the avoidance of partial and general functional excesses and (what is in reality the same thing) in adjusting by will or by environment the rate of living to the simplest needs.

A. J. S.

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PROTOZOÖLOGY. By CARY N. CALKINS, Professor of Protozoölogy in Columbia University, New York. Pp. 349; 125 illustrations; 4 colored plates. New York and Philadelphia: Lea & Febiger, 1909.

WHATEVER the ultimate quantitative limit of the field of protozoölogy in medicine, there can be no doubt that it must be accorded the qualitative dignity of bacteriology as a branch of study dealing with the causation of disease. That it should at present be less developed than bacteriology, of course, can easily be under-

stood when we realize that the cultural methods employed in the latter subject are only in the most limited measure applicable to the protozoa. Moreover, it is doubtful whether we will ever be able to systematize as satisfactory methods for the extracorporeal cultivation of these organisms, owing to the fact that the life history of each is made up of stages more or less distinct from one another and that the conditions for each, in some measure, vary. Further, there is reason for us to believe that even where cultivation is possible, cultural variations of such marked type are likely to arise that it will only be after extensive study that one can establish the identity of the organism in each of such variations. For these reasons protozoölogy must necessarily, to a much greater degree than bacteriology, depend upon morphological studies. This must mean that the investigator must acquire familiarity with a wide range of minute organisms, and each in a number of different appearances; and further, that investigations must, to a very great extent, depend upon the most painstaking microscopic examination of each part of the material under investigation. Time and long preliminary preparation must be demanded of the protozoölogist, and it can scarcely be expected that the ordinary practitioner of medicine will ever be in a position to devote himself, save in a very superficial manner, to such a study. It is possible that such methods of cultivation as have been accomplished by Novy in the case of trypanosomes, or of Musgrave in the case of the amœbæ, may be extended to facilitate the work; but little can be hoped to obviate the very much greater amount of direct individual attention to morphological characteristics of the material on the part of the trained laboratory worker than is required in bacteriology.

Dr. Calkins' book is an evidence of the growing interest which the medical profession holds toward the protozoa, and the fact that it is written by a protozoölogist rather than by a medical man indicates the difficulties which would be encountered by the latter in the study of these intricate life histories. While Dr. Calkins inveighs against the restriction of protozoölogy to pathogenic forms, and urges upon the profession the very great value of the study of the protozoa in the appreciation of the various vital processes, both normal and pathological, yet the reader will not be disappointed in his expectation of finding that the work deals largely with the pathogenic forms.

The book is based upon a series of lectures before the Lowell Institute in 1907. The first portion (which closely recalls the author's former book on *The Protozoa*) is devoted to a systematic discussion of the general organization of protozoa, their physiological activities, and the phenomena of their life cycle, a separate chapter being given up to conjugation, maturation, and fertilization. An extremely important chapter is devoted to parasitic relations of the protozoa, the lives of these organisms as parasites, the modes

of transmission, the exogenous life of protozoan parasites, and reference to the effects of protozoan parasites upon their hosts. The latter chapters of the book are given over to consideration of pathogenic varieties. Under the flagellates, the spirochetes and their position in nature are fully discussed; and various problems that have arisen in connection with the amœba and dysentery, the nigri bodies in rabies, Guarnieri's bodies and smallpox, as well as obscure diseases subject to protozoan origin, are fully discussed.

Dr. Calkins' reputation as a protozoölogist and the close and much appreciated interest which he has taken in medical problems in which protozoölogy has application are a guaranty of sympathetic and full consideration of such questions. The work undoubtedly is a forerunner of other books upon the same subject, and will itself be the basis of studies in our medical laboratories in protozoölogy. It is admirably adapted as a text-book in schools where it is contemplated this branch may be taken up as part of the course of instruction; and while it does not pretend to include all forms of known pathogenic protozoa, and therefore cannot be regarded as a systematic treatise, it is an absolutely essential volume in the laboratory of every worker in clinical or general pathology or in any branch of etiology.

A. J. S.

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THE PRINCIPLES AND PRACTICE OF PHYSICAL DIAGNOSIS. By JOHN C. DA COSTA, JR., M.D., Associate in Clinical Medicine in the Jefferson Medical College; Chief of the Medical Clinic and Assistant Visiting Physician to the Jefferson Hospital, Philadelphia. Pp. 548; 212 illustrations. Philadelphia and London: W. B. Saunders Company, 1908.

DR. DA COSTA has prepared a very excellent work on physical diagnosis, of which forty-five pages are devoted to the general methods, four hundred to the thorax, and sixty-four to the abdomen. The book is distinctly readable. The descriptions are, as a rule, clear, sufficiently detailed, and written evidently by one who possesses not merely a book knowledge of the subject, but who has tested for himself and reached definite conclusions upon the majority of the methods that he describes. Each section is introduced with a brief paragraph upon the clinical anatomy, and each disease described is preceded by a paragraph upon the clinical pathology. The latter paragraphs constitute a valuable addition to the book, and at any rate for the student, serve to make more understandable the physical signs that are subsequently described.

It is not to be supposed, however, that Dr. Da Costa is greatly superior to his predecessors in overcoming some of the inherent diffi-

culties of the subject. His discussion of the quality of percussion sounds is practically a statement that sounds have different qualities. In his discussion of pitch, he regards the sound elicited by percussion apparently as a single note and not, as it really is, a complex of vibrations of different rates.

The section on the examination of the thorax is enriched with many satisfactory illustrations that, without repetition, serve to emphasize the points brought forth in the text. As in other works of this character, the nude human female serves as a model upon which to sketch the various outlines and symbols that are supposed to elucidate the description of the physical signs. This seems to us an unnecessary subordination of science to assumed art. Aside from this the diagrams and illustrations and, in particular, the sphygmocardiograms are of unusual excellence. The signs to which proper names are attached are given quite fully, but it would be of advantage if references to the original article or work were appended. Dr. Da Costa has evidently preferred not to quote literature, although he is undoubtedly familiar with it, and in this manner has probably lessened the bulk of his book, but even for students, we think, some references are desirable.

There are a few points to which we should like to call attention. He fails to mention the fact that a normal percussion resonance may occasionally be obtained over a pneumothorax cavity. The diagrams of the respiratory and cardiac sounds add little if anything to the description from the text. It should be noted that oëgophony may be heard over as well as above a pleural effusion. The paragraph on the physical signs of bronchiectasis is inadequate, and is misleading in so far that the dilatation of the small bronchi, which is the commonest pathological condition of this nature, does not give rise at any time to the signs of cavity. In regard to the movable dulness of the pleural effusion, it is stated that it is rarely demonstrable as a result of change in posture of the patient. This is surely not the common experience. Kussmaul's pulsus paradoxus has not in our experience been frequently demonstrated in obliterative pericarditis, and Friedreich's diastolic collapse of the jugulars is an equally elusive sign. Dr. Da Costa is one of the few writers who calls attention to the enfeeblement of the second sound at the base as significant of myocarditis. He speaks too confidently of the existence of relative pulmonary regurgitation.

The section on the examination of the abdomen and the abdominal viscera is entirely inadequate. The illustration of enteroptosis is rather an exaggerated than a usual form of this condition. The description of the examination of the intestines is very brief, and auscultation is dismissed with a disparaging paragraph.

Much could be said in praise of the different parts of this book were it not for the restricted space at our disposal.

J. S.